

# Mosquito:

## Getting to know the enemy

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Nearly two million species of insects grouped, into about 30 orders, live in many different habitats throughout the world. They are very important because they pollinate flowers and are food for birds and other animals. However, many insects are pests that feed on crops or spread diseases. One such insect is the mosquito.

There are about 3,000 species of mosquitos, which are distinguished by their antennae of 14 or 15 segments and by the presence of scales on the veins of their wings. The larvae are called wigglers and are aquatic, feeding on plants, algae, and microscopic animal life. Some mosquitos feed on the juices of plants, and some do not feed at all in their adult stage. Only female mosquitos suck the blood of humans and other warm-blooded animals, because they need blood to develop each batch of fertile eggs. But like the male mosquito, females feed only on nectar for their food source.

The female mosquito locates her human targets by following the carbon dioxide that we exhale. When the mosquito bites a human, she injects saliva into our skin before drawing blood. This saliva helps her to penetrate the skin and prevents blood clots from developing in her food canal. The welts and itching that we experience after being bitten are an allergic reaction to the saliva.

Few people like mosquitos. They inflict itchy bites and buzz around our ears. But mosquitos are much more than a nuisance, they can pose serious health hazards. Insects that feed on blood have the potential to transmit diseases between humans and between animals and humans. Mosquitos are the most highly developed insect bloodsuckers and are carriers of several very serious diseases, namely yellow fever, encephalitis, dengue fever, and malaria.

### Yellow Fever

Yellow fever is a viral disease carried by the yellowfever mosquito, *Aedes aegypti* (Latin). The disease occurs in tropical and subtropical regions, namely in areas of Africa and South America, and affects humans as well as monkeys. The mosquito-borne virus is involved in two transmission cycles. In “jungle” yellow fever, transmission occurs between forest-dwelling mosquitos and non-human primates, while in the “urban” cycle transmission is between domestic mosquito species, especially *Aedes aegypti*, and humans. The disease is characterized by chills; head, back, and muscle pain; and nausea and vomiting. These symptoms usually appear within three to six days after exposure. Death usually occurs 7-10 days after onset of the illness, with a period of remission on the third or fourth day. The mortality rate of yellow fever is from 30 to 75 percent.

### Treatment

Unfortunately, no specific treatment exists for people who get yellow fever, but yellow fever is preventable. People who live in infected areas can be vaccinated with a live virus vaccine against the disease. The vaccine now used meets strict World Health Organization (WHO) requirements

of safety and is one of the most effective vaccines, resulting in the development of long-lasting antibody in 95 percent or more of recipients. A single dose gives immunity for 10 years or more, followed by a booster every 10 years. It is recommended for children over six months of age. People who have had yellow fever are immune for life.

## **Prevention**

Since mosquitos are generally most active during early morning and late afternoon hours, it is best to avoid exposure at these times. People can take further precautions to avoid mosquito bites by using insect repellent, wearing protective clothing, placing screens on windows and doors, and sleeping under mosquito netting.

## **Encephalitis**

Viral encephalitis is a disease transmitted by mosquitos from infected small animals, usually birds and rodents, to humans. It is a disease that causes inflammation of the brain, and the risk of getting the disease is highest during warm months when birds and mosquitos reproduce. There are several types of mosquito-borne encephalitis that infect people in the United States: Eastern equine encephalitis, Western equine encephalitis, St. Louis encephalitis, and LaCrosse encephalitis. Although most people infected with viral encephalitis have only mild or no symptoms, serious cases can cause headaches, high fevers, lethargy, convulsions, delirium, coma, and even death. Symptoms appear 4 to 15 days after being bitten.

## **Treatment**

There is no special treatment available for this disease. Medical care is aimed at managing the symptoms and complications that the disease causes.

## **Prevention**

During the mosquito season, people should take the following precautions: wear protective clothing between dusk and dawn; apply mosquito repellent to skin and clothing; have screens on all windows and doors; drain or cover all standing water; use mosquito netting to cover sleeping infants.

## **Dengue fever**

Dengue fever is a viral disease carried by the Aedes mosquitos. The disease occurs mainly in tropical and subtropical regions and is most common during the rainy season in areas infested with the infected mosquitos. According to the WHO, 2.5 billion people are at risk from the four major types of dengue virus, which is transmitted to people from infected mosquitos. Each year there are tens of millions of cases. Symptoms of dengue fever generally start 5 to 6 days after being bitten by the infected mosquito and include fever, painful headaches, eye, joint, and muscle pain, and rash. The rash usually begins on the arms or legs about 3 to 4 days after the fever starts. These symptoms resolve completely within 1 to 2 weeks.

### **Treatment**

There is no vaccine against dengue fever. Recommended treatment for the disease is bed rest and common drugstore pain and fever medication. Since there are four types of dengue viruses, having one type of virus will only give protection against that type, not the others.

## Prevention

Because *Aedes* mosquitos are usually most active during early morning hours just after daybreak and late afternoon hours, it is wise to avoid exposure during these times. Also, using netting and screens, mosquito repellent, and protective clothing will reduce exposure to mosquito bites.

## Malaria

Malaria is a tropical disease caused by protozoal parasites. It is spread by only 60 of the 380 species of the anopheline mosquito, especially during rainy seasons. Malaria annually affects from 300 to 500 million people worldwide, and causes more than one million deaths. Symptoms may occur in 6-8 days or several months after being bitten and include regularly occurring fevers with chills, nausea, and muscle pain. Infection results in the enlargement of the spleen and liver, and in fatal cases, capillaries in the brain are blocked. The majority of malaria deaths occur among young children and pregnant women.

## Treatment

Early diagnosis and prompt adequate treatment is essential in curing malaria and preventing death. A limited number of drugs for treating malaria are available. However, in some regions the parasites are resistant to certain antimalarial drugs, particularly chloroquine. People continuously infected gradually develop immunity to the disease.

## Prevention

Preventing malaria includes a variety of measures: wearing protective clothing, using repellents, and sleeping under bed nets treated with insecticides. Community protection measures, like using insecticides, are directed against the mosquito to control transmitting the disease. But, Bti (see next page) may be a solution because mosquitos are becoming more resistant to chemical insecticides, which have been used for decades to control malaria.

## Questions for Discussion

1. Medical science has made great advances in the last century. Can you name a few?
2. Which of these diseases do you think poses the greatest health hazard in your country? Why?
3. If you were a medical researcher, which disease would you want to eradicate? Why?

## Vocabulary Development

Sometimes similar looking words have different meanings, but often it is possible to guess the meaning. For example, if you know the word chemistry, you may guess the meaning of the word chemical. In the article, find words related to the words below and try to guess their meanings:

repel protect medicine allergy search plenty cure treat